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ABSTRACT

The new possibilities for self-fulfillment while communicating in new and more immediate ways with a growing and changing world that have been opened up by computers should be offered to all young people, and most states have launched campaigns to teach computer literacy. As we implement state-mandated computer literacy curricula, however, we need to consider carefully those issues surrounding educational computing that are related to classroom computer use as well as the social implications of computing. Two of these concerns are equity and gender. Equitable distribution of the benefits of computing must begin with a more critically-aware and concerned body of professionals to ensure that educational computing is used to compensate for, rather than to reinforce, social inequities and differences in ability. With regard to gender, comparatively few high school females are currently active in computer science, and even in elementary classrooms, computers seem to "belong" to the males. Both of these issues can be addressed successfully when teachers organize computer instruction and usage around the themes of creating, informing, and communicating, rather than around the machines themselves. These themes stress the importance of the computer as a user-controlled and user-beneficial tool, allowing all computer literacy students to be accepted for what they are and can be, and for what they want and need. (LMM)

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BEYOND THE BANDWAGON:
SOME PROMISES AND PROBLEMS OF EDUCATIONAL COMPUTING

An Occasional Paper
Spring, 1984

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ABSTRACT

This essay directs the attention of classroom computing enthusiasts toward two of the "less frequently addressed" issues surrounding computer instruction: equity and gender. The author believes that educational computing can successfully address these concerns when teachers organize computer instruction and usage around the themes of *creating, informing,* and *communicating* rather than around the machines themselves.

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THE BLINDNESS OF FAITH

> Those of us who have "gotten religion" about instructional computing tend to be rather evangelical about the technology and its implications for teaching.
> Sandra Pratscher (1983:85)

The din of the educational computing bandwagon is subsiding. Disciples have emerged, and the machines are arriving. Hardly a school in the country is without one sort of computer or another and, according to a recent survey (Christen and Gladstone, 1983:37), "47 states have launched campaigns aimed at enabling their schools to impart [computer] skills to their students."

We who are "believers" will have fewer problems implementing state-mandated computer literacy curricula, for we know, in ways that are sometimes hard to explain, that learning computer skills can benefit all of our citizenry. All young people will need computer literacy skills just as they have always needed the skills to read, write, and cipher. We feel strongly about this, I believe, because we have come to know the seemingly limitless personal benefits the computer holds for us. Like the other "basics," it has allowed us to become more creative and better informed in both our personal and professional lives. Computers have opened up new

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possibilities for self-fulfillment while allowing us to communicate in new and more immediate ways with a growing and changing world. Surely these opportunities should be offered to all young people.

So we wade into the thickening murk of computer literacy. But let's not do so with blind faith. Unless we step carefully and purposefully, we may find ourselves floating downstream toward ends we did not plan, intend, or foresee. Too many important issues, left unconsidered, could lead our intentions astray. Eric Hoyle (1983:58) divides these issues surrounding educational computing into two basic relationships: those between computers and social values, and those between computers and the contested values in education. Belonging to the former group are issues such as control, access, and secrecy; belonging to the latter are concerns regarding equity, individualism, gender, control, and differentiation. Most comprehensive computer literacy curricula address the social implications of computing.[1] It is Hoyle's second group of issues -- those which surround what he calls the "contested values in education" -- which are more immediate to, yet less frequently addressed by, those of us who endorse classroom computing. Because space limitations prevent a thorough investigation of all these issues [2], I reflect here on two of them which too

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often go unheeded: equity and gender.

THE EQUITY CONCERN

> [W]e're engaged in making a Faustian bargain, not only with the computer, but with science and technology in general... Joseph Weizenbaum (in Rosenthal, 1983:95)

In "Computer Equity Comes of Age," Winkle and Mathews define the equity concept:

> If computer literacy is fast becoming a basic skill, then we must consider the question of equal access to this skill for each person. This is the concept of computer equity. It requires awareness, action, and the flexibility to employ differing approaches to meet differing needs. Computer equity means individualizing instruction in computer literacy, since students approach this new technology with varying experiences and expectations and interact with microcomputers in different ways. (1982:315)

It is easy to see how the need for individualization in otherwise group-oriented classrooms takes on a renewed importance. Children with computers in their homes have an obvious advantage, as do young people fortunate enough to attend the growing number of extracurricular (and costly) computer workshops, classes, and summer camps. Is educational computing being used to compensate for or reinforce social inequities?

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Sometimes, classroom computer time is offered as a reward for those students who do "good" work or finish assignments quickly. Is this not serving to widen the gap between advanced and slower students?[3]

Numerous authors (e.g., Benderson,1983; Harvey,1983; Hunt,1983; Lipkin,1983) have studied the relationship between the economic level of a school or school district and the availability of computer resources. "Rich" schools have twice the number of computers as do "poor" schools. Even within schools and classrooms which attempt to balance social class, race/ethnicity, and achievement levels, a distinct pattern in computer use exists. Stated simply, certain students spend much of their time having a computer tell them what to do while other students spend much of their computer time telling it what to do. (It's no mystery which students belong to which user group.) Without dedicated effort on our parts these patterns will persist.[4] John Lipkin (1983:26) believes that "if the benefits of the computer are to be provided to all students on an equitable basis...[we will need] additional funding and the development of resources -- including skilled teachers and appropriate quality software." The resources and software are being developed at present, but we ought not count on additional funding. Equitable distribution of benefits must *begin* with a more critically aware and concerned body of professionals.

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THE GENDER CONCERN

> Those of us who are responsible for implementing computer programs must be conscious of the affirmative action implications of such programs. The social consequences of preparing a tiny male technological elite to provide leadership are ominous and forboding.
> (Bakon, Neilson, & McKenzie 1983:27)

Many devoted educators -- most of them women -- are committed to exposing the myth of the so-called educational gender gap. The belief that females of any age are academically inferior because of their sex is no more acceptable today than believing that race, color, or age alone are responsible for inferior or superior scholarship.[5] Joan Skolnick and others (1982) have carefully documented the wide disparity between males and females in their successes in and attitudes towards math and science. Bakon, Neilson, & McKenzie (1983:27) believe that this "long-documented gap...is now being replicated in computer labs." A walk through almost any high school computer lab will indicate the difference in interests of female and male students -- interests that were shaped early in their lives. Comparatively few high school females are active in computer science classes. Computing has always been considered "man's work" (Benderson,1983:22). This is due in part to *learned roles* supported by

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peer and cultural norms.

Even in elementary classrooms computers seem to "belong" to the males. Jacqueline Boss (1983) talks about her experiences as a middle school media specialist responsible for teaching computer literacy. She notes that having a limited number of machines often leads to competition among the students for computer time, competition which usually results in male victories. Nevertheless, she does not believe that adding more machines will automatically change that situation. Both teachers' and students' deep-seated sex-role stereotypes need to be changed. Ms. Boss believes that:

> [M]en and women have a strong tendency to approach machines differently. Men seem to see machines as another medium to dominate, while women see them as another medium to be dominated by. Women are just as happy to walk away from the microcomputer and let someone else master it. It appears that the aggressive behavior of men that encourages them to dominate women also encourages them to dominate machines. (1983:14)

Few young women are raised with an understanding of how male-dominated workplaces, communities, and political spheres will suppress them; they are not told that they will need to work *twice* as hard and be *twice* as successful (receiving less money and less respect) if they

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wish to enter certain "masculine" fields. This ignorance can only be remedied by adults, whether in the home or in the classroom, who care enough about the rights of women to dispel stereotypes early and consistently. Classroom computing is as good a place as any to begin. If we are intent on teaching skills that will lead to a productive citizenry, then the skills of perceiving a situation which inhibits female productivity and working to change that situation through personal and collective efforts ought to be included in our instructional goals.

THE CLARITY OF FOCUS

> Results are what you expect, and consequences are what you get. Anonymous

We live in a society which is, out of necessity, investing heavily in technology while controlling unimaginable amounts of information. It has been decided, both for and by us, that the schools -- through computer literacy and computer science curricula -- can provide the most efficient and effective way to prepare people for life in this society. That decision should be of immediate concern to educators. This essay has pointed out certain dangers in the thoughtless acceptance of computer literacy

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curricula and the careless incorporation of computers in education. Computers cannot provide a "technofix" for the human problems of schooling. As tools, they have much to offer, but their value can only be fully realized by those who use them with care and intelligence.

Educators are among those charged with the maintenance and betterment of society. We ought not be deluded by the power of technology. Arthur Lewis (1983:10) warns that "we must not expect technology to solve our social problems in the same way it has solved, and created, so many scientific problems. That particular trap represents an abdication of our personal responsibility for improving society." Classroom teachers can avoid that trap by allowing every student to come to know the computer as a tool which s/he can use to become more creative, more efficient, more informed, and more in touch with the world we share. Bowles and Gintis remind us that:

> Technology . . . can only increase the set of alternatives open to society toward the satisfaction of its needs. Harmful social outcomes are the product of irrational power relationships in the dynamic of social choice, not the inevitable power of scientific rationality or technological necessity. (1976:16)

For those who can understand *and* use computers, technology will become a

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conduit for both personal and social empowerment.

Creating, informing, and communicating, then, may be the most important themes for educational computing. Work toward computer literacy can be organized around these themes rather than around the machines themselves. Each theme stresses the importance of the computer as a tool -- a tool which is user-controlled and user-beneficial. This approach allows everyone being "taught" computer literacy to be accepted for who he is and can be and for what she wants and needs. Our goals of educating Americans to make the most of their life's experiences will be met only when *everyone* -- regardless of race, gender, class, or age -- can use this tool as a medium for self-expression and self-fulfillment.

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NOTES

1. Anderson (1983:95) notes that: "[A] problem in teaching comprehensive computer studies courses is that computer programming activities tend to engulf the attention of both students and teachers. *Social issues are likely to be scheduled for the end of the term when little or no time is left for them.* Computers and social issues, sometimes called "awareness" issues, should be integrated with hands-on computer activities." (emphasis added)

2. The essays found in Megarry and others (1983) provide a comprehensive view of the global concerns for computer literacy. Also helpful when considering educational issues are Harvey (1983), Johnson (1982), Quinn, Kirkman, and Schultz (1983), Seidel, Anderson, & Hunter (1982), and Winkle and Mathews (1983).

3. For further investigation of the equity issue see Benderson (1983), Harvey (1983), Hunt (1983), Lipkin (1983), and Winkle and Mathews (1983).

4. Articles by Quinn, Kirkman, & Schultz (1983) and Zamora (1983) suggest that we break these patterns by changing our instructional focus from *computer* literacy to *information* literacy. This shift in emphasis would provide classroom teachers the opportunity to "...focus on the concepts and skills of information management rather than on a body of content

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reflecting today's microcomputers" (Quinn, Kirkman, & Schultz, 1983:38). The goal of this new emphasis would be "...the development of empowered and fully functional citizens of an information-based society" (Zamora, 1983:10).

5. In her book *Invisible Women: The Schooling Scandal*, Dale Spender (1982) provides a bibliography of work done in this area. The January 1982 issue of *Social Education* is also dedicated to sex equity in education. Zimmerman's (1983) collection entitled *The Technological Woman: Interfacing with Tomorrow* looks more specifically at women and technology. This topic is also discussed in Bakon, Neilson, & McKenzie (1983), Benderson (1983), and Winkle and Mathews (1983).

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